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CONTENTS.

EDITORIAL:

The Great Conflagration at Baltimore 9

LESSONS OF THE BALTIMORE FIRE (Illustrated with Map and Photographs.)
By F. W. Fitzpatrick 10

A PROPER BUILDING CODE.
By Frederick Baumann 14

THE TOWER GROUP—UNIVERSITY OF CHICAGO 15

HOT WATER AND TANK HEATERS 15

A COMMERCIAL BUILDING 16

MOSAICS 16

OUR ILLUSTRATIONS 16

INDEX TO ADVERTISEMENTS ix

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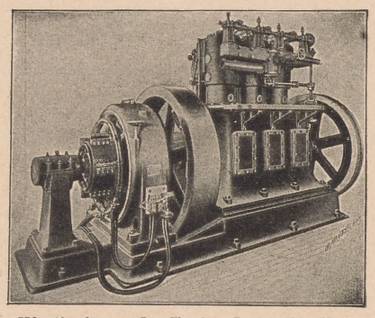

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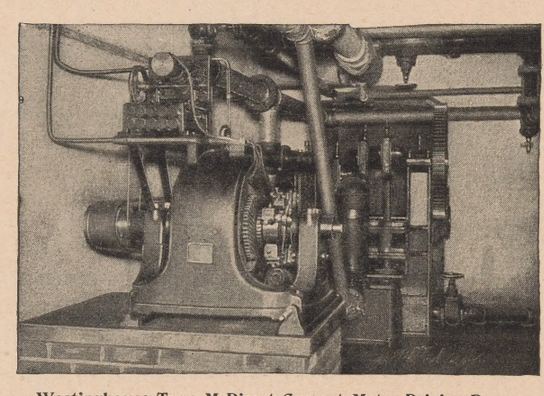

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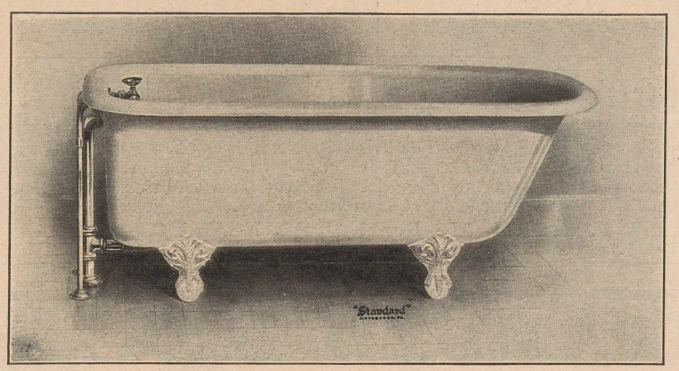

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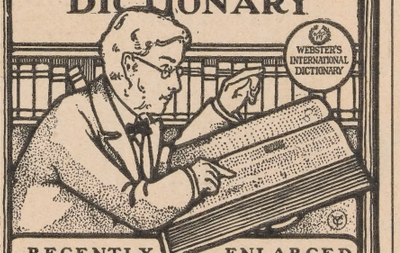

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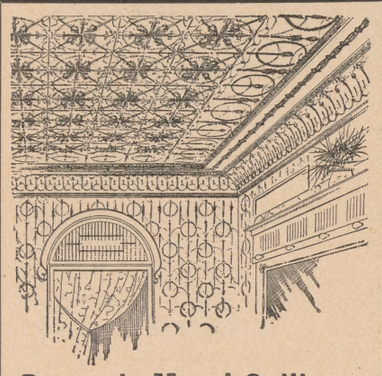

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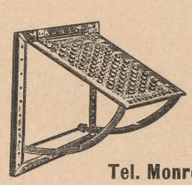

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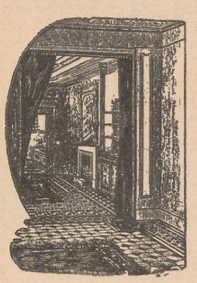

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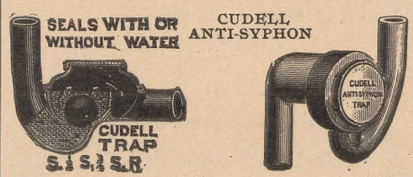

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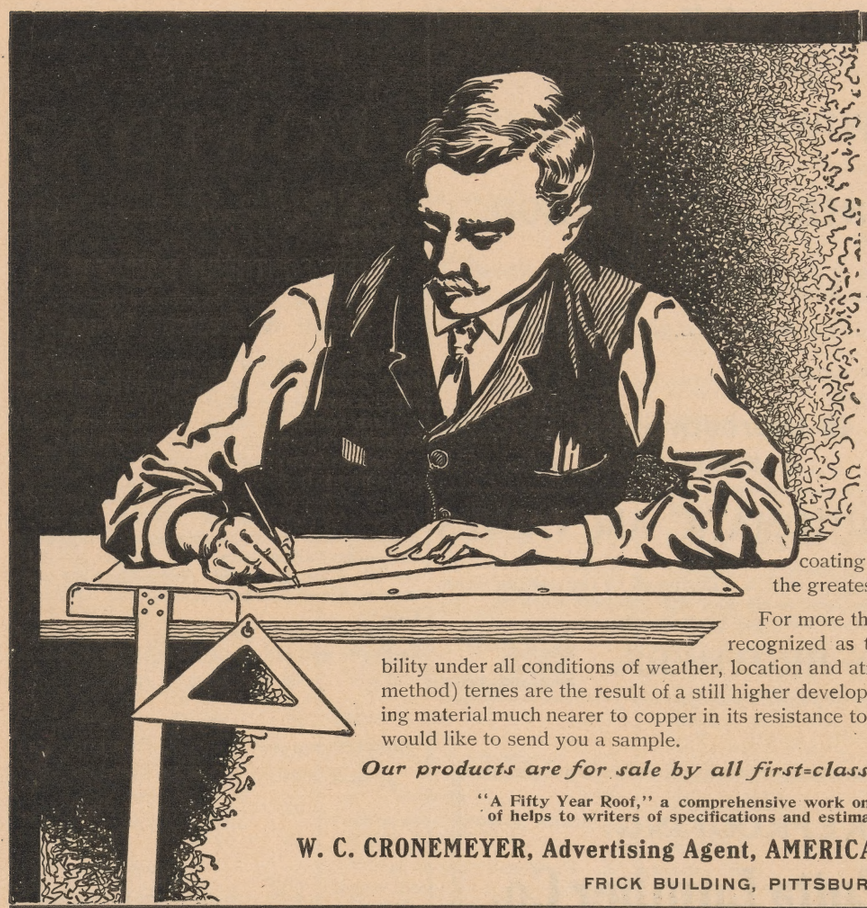

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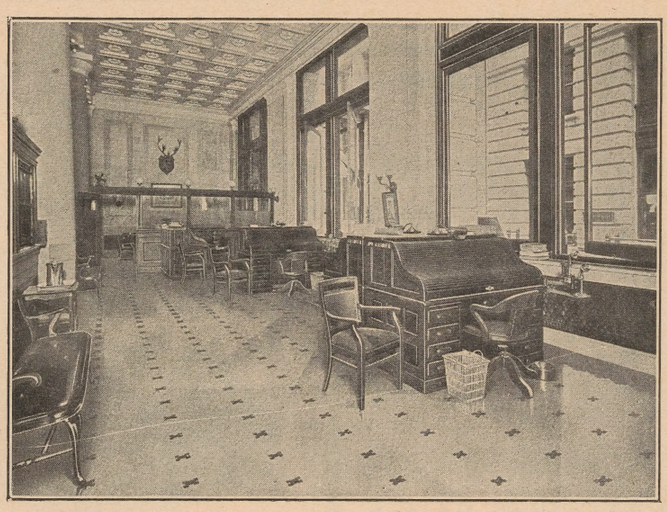

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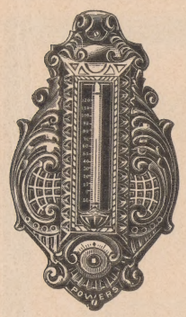

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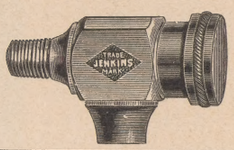

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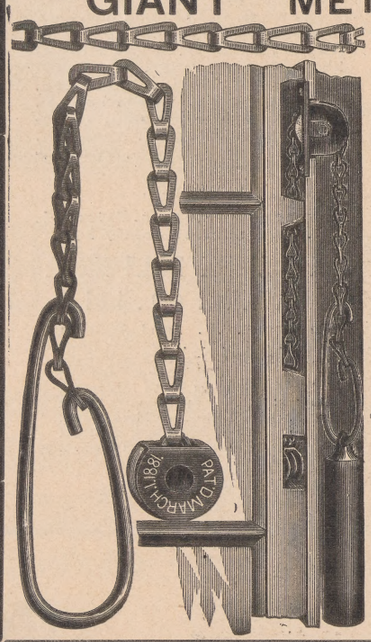

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INDEX TO ADVERTISEMENTS.

	Page
Architectural Drawing.	
Deane, E. Eldon	XV
Architectural Iron Works.	
The Winslow Bros. Co	II
Brown Bros. Mfg. Co	V
American Sidewalk Light Co.	IX
Architectural Photographers.	
Taylor, J. W.	II
Architectural Views.	
Taylor, J. W.	II
Boats.	
W. H. Mullins	VIII
Boiler Covering.	
The Keasbey & Mattison Co.	XII
Bricks (Pressed).	
Chicago Hydraulic Press Brick Co	IX
Findlay Hydraulic Press Brick Co	IX
Illinois Hydraulic Press Brick Co	IX
Kansas City Hydraulic Press Brick Co	IX
Menominee Hydraulic Press Brick Co	IX
Omaha Hydraulic Press Brick Co	IX
St. Louis Hydraulic Press Brick Co	IX
Brick (Enameled).	
Hydraulic Press Brick Co	IX
Brick (Ornamental).	
Chicago Hydraulic Press Brick Co	IX
Findlay Hydraulic Press Brick Co	IX
Hydraulic Press Brick Co	IX
Illinois Hydraulic Press Brick Co	IX
Kansas City Hydraulic Press Brick Co	IX
Menominee Hydraulic Press Brick Co	IX
Omaha Hydraulic Press Brick Co	IX
Builders' Hardware.	
Orr & Lockett	XVI
The Yale & Towne Mfg. Co.	XVI
Builders' Sundries.	
The Yale & Towne Mfg. Co.	XVI
Building Papers.	
Cabot, Samuel	XII
Cements.	
French, S. H., & Co	VI
Clothes Dryers.	
Conduit.	
National Fireproofing Co	36
Cordage.	
Samson Cordage Works	XVI
Creosote Stains.	
Cabot, Samuel	XII
Drawing Material and Implements.	
Abbott, A. H., & Co	XII

	Page
Electric Plants.	
Westinghouse, Church, Kerr & Co	IV
The Westinghouse Machine Co	IV
Elevators.	
Link Belt Machinery Co	XII
The J. W. Reedy Elevator Co	XIII
Elevator Supplies.	
Engineers.	
Westinghouse, Church, Kerr & Co	IV
The Westinghouse Machine Co	IV
Fireproof Doors.	
Kinnear Mfg. Co.	X
Fireproof Shutters.	
Kinnear Mfg. Co	X
Fire Extinguisher.	
Fireproofing.	
Associated Expanded Metal Co's.	VI
Illinois Terra Cotta Lumber Co.	VIII
National Fireproofing Co	XIV
Pioneer Fireproofing Co	XIV
The Roebling Construction Co	XII
Floor Polish.	
Butcher Polish Co	X
Gas Engines.	
Westinghouse, Church, Kerr & Co	IV
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Metallic Fixtures and Furniture.	

	Page
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Samson Cordage Works	XVI
Sash Locks.	
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Cabot, Samuel	XII

	Page
Shingle Stain.	
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Cabot, Samuel	XII
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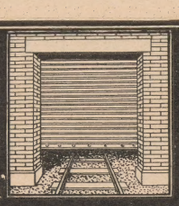

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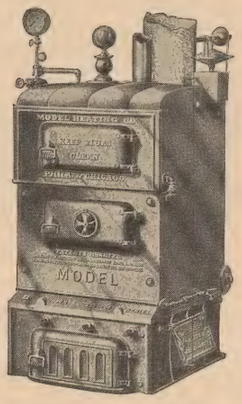

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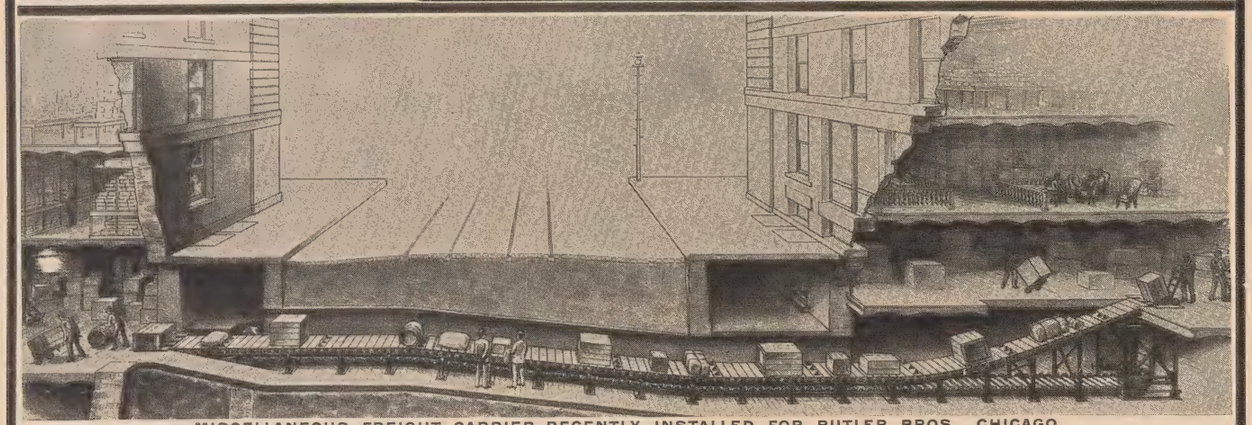

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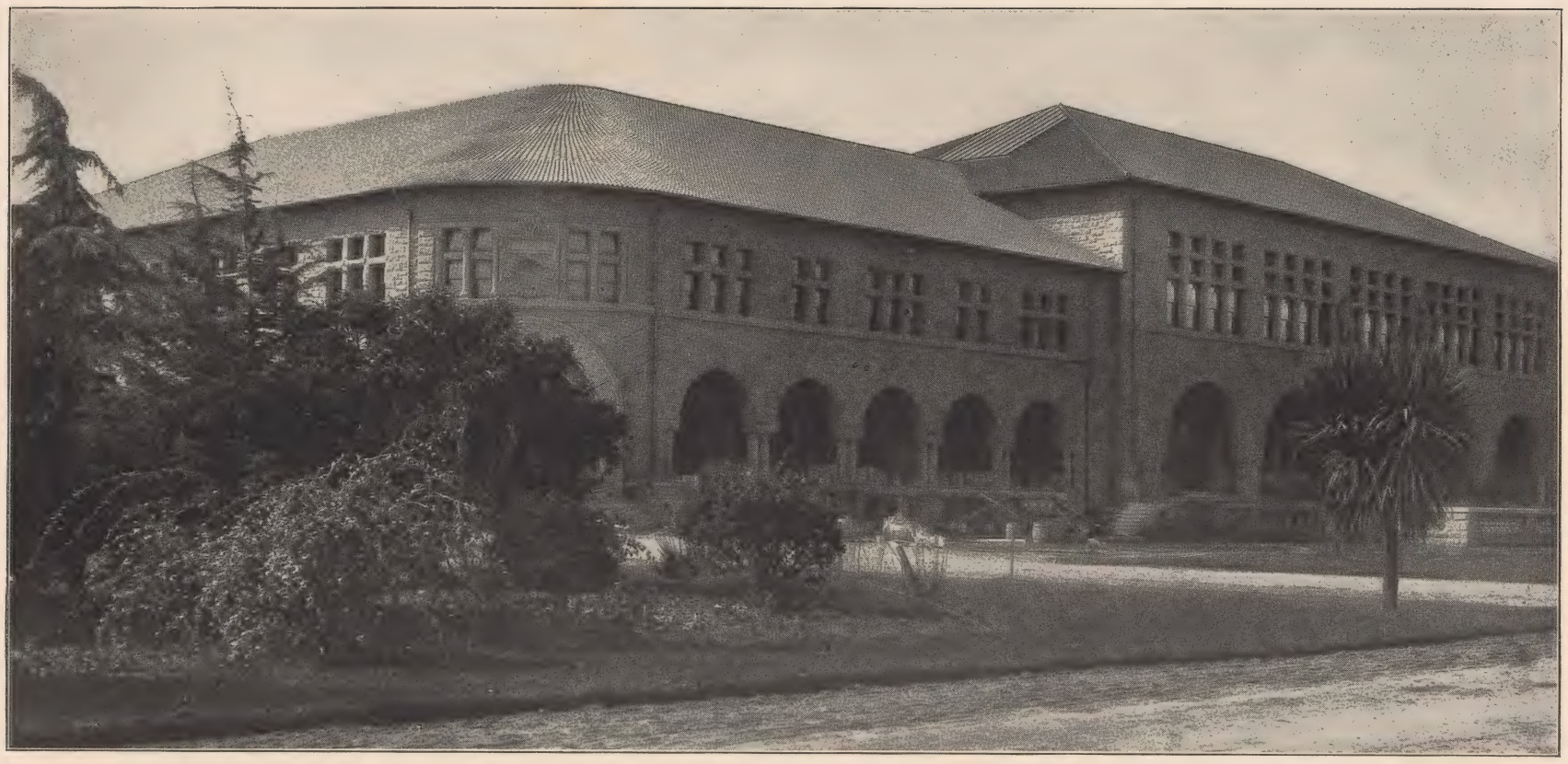

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IN THE WEST.

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The Great Conflagration at Baltimore.

While we have presented the report of our special correspondent upon the effect of the Baltimore fire especially upon the modern steel and tile structures, there is much of interest to be found in the comments of the press of the country, which is wont to discourse hurriedly upon every subject even to the construction of buildings. Some of these do it remarkably well and give evidence of some conception at least of the subject, while others show a lamentable ignorance of even the first principles that enter into the question and voice the first reports that ignorant and panic-stricken reporters send out as facts. We heard through this source that the steel buildings in Baltimore had completely collapsed, that the Masonic Temple in Chicago had burned — an editor up in Vermont stating that in consequence of this latter incident (in which a stockroom was burned out with absolutely no damage outside its walls, except an accumulation of smoke) that the city would restrict the heights of buildings. This wise editor also states that because the "skyscrapers" at Baltimore "acted as great chimneys, drawing the flames upward by a powerful draft," the same restrictions would be made there. There are many reasons why the height of buildings should be restricted, but they are largely ethical. The main lesson of the Baltimore fire is that our steel buildings, properly protected with hollow tile, are fireproof, even at a heat of three thousand degrees. Whether the extra cost of wire glass and fire shutters in installation and maintenance will compensate for the danger of interiors being cleaned out by neighborhood fires, or whether all interior finish and furnishing will be fireproofed for the same reason, is a question for owners and insurance companies to decide. Architects and contractors can supply such buildings, if called for. The Baltimore fire has shown in the most practical manner possible the stability of the steel and tile system. It also shows that no weakness of administration should allow private parsimony to construct buildings by any other method. It also shows that the hollow tile used should be if anything of additional strength to that now manufactured, and that it should be installed by skilled men under expert supervision. Wire glass was amply proved to be a first-class fire-resisting medium, and terra cotta can be liberally used if made for permanency rather than for ornamental effect. Large cities and small alike should not wait for a sweeping conflagration to cause them to revise building laws. It takes more than one fireproof structure in a block of combustible buildings to arrest any considerable fire, but such can not occur when all have the stable qualities that obtain in the so-called "skyscraper." No wooden studding or joists should be permitted in any but the smallest detached building, and no wooden walls anywhere. With this as a starter the people would soon get in the habit of using non-combustible materials. After all, this liberal use of wood is a habit that has grown from the loghouse period, and the seemingly endless forests of pine that are now fast disappearing. New Orleans, San Francisco and a dozen other cities are in the same position as Baltimore a month ago, waiting only for a quiet Sunday with the fire department off duty, a good start and a high wind to repeat the experience. It is plain that the preventive measures must be taken largely by the building public, and the public press should not only be informed, but urge every form of fireproof construction that is not prohibitive in the most insignificant of structures, while the city should be urged to condemn all old buildings that in their construction are conspicuously of the "firetrap" class. Great pains have been taken in securing comprehensive photographs of the only remaining structures, and these were all fireproofed buildings. As a "horrible example," the effect of the fire on the new city hall is shown, which, with solid brick and stone walls and an interior of wooden joists and cast-iron columns, collapsed almost as completely as the more combustible structures. The lesson of this fire certainly is: Cover every structural part with a fireproof material.

LESSONS OF THE BALTIMORE FIRE.

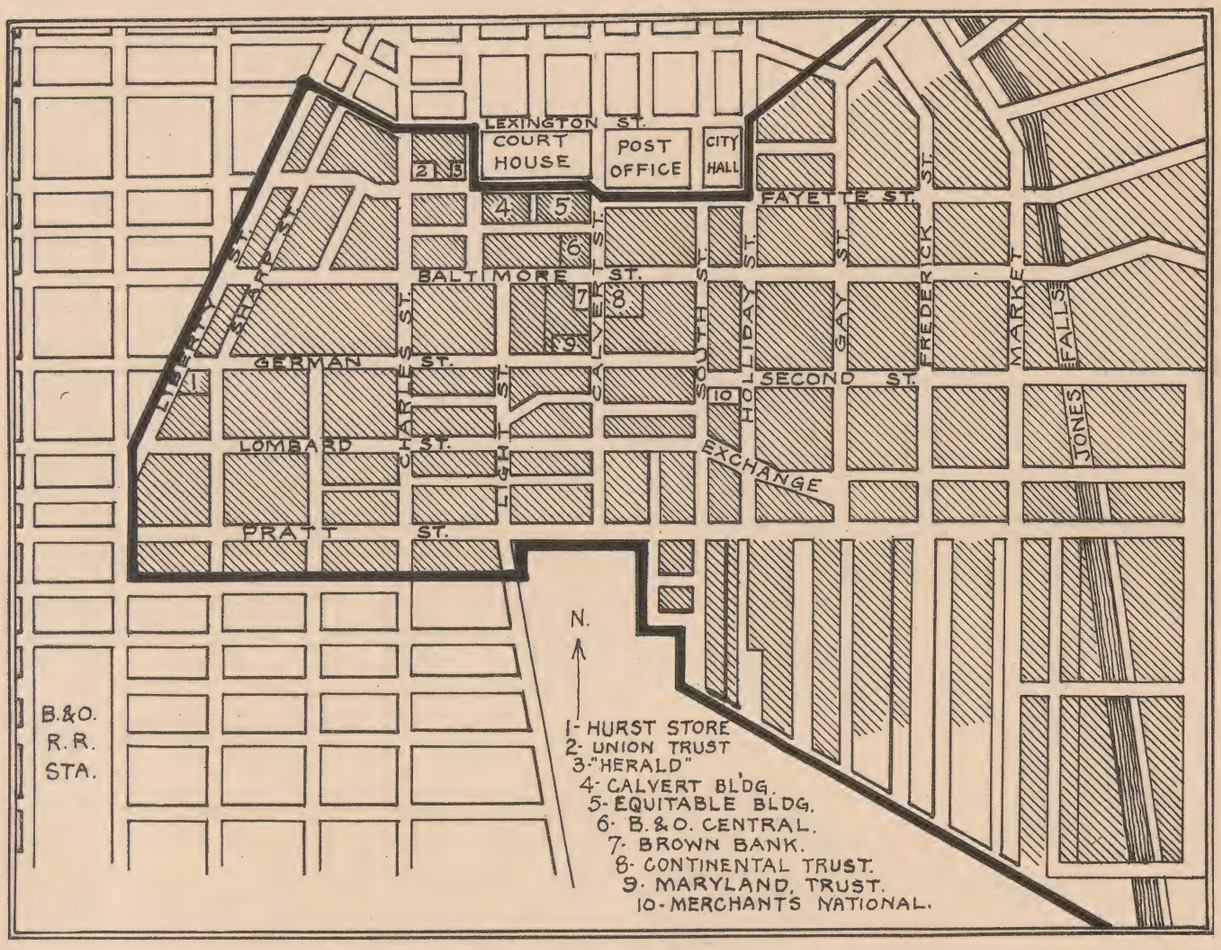
BY F. W. FITZPATRICK.

ON February 7, about eleven o'clock in the forenoon, a fire started in the center of the business section of Baltimore, Maryland, and after raging thirty hours had devastated one section of about a quarter of a mile long and three-quarters of a mile wide, and another of about forty acres, destroying about $1,000,000 worth of property.

Never before in the history of fires have the theories of fireproof construction received so severe a test, and that those dozen skyscrapers that were in the burned district are still standing, and that their structural members that were properly protected are intact, is all the vindication the most enthusiastic supporters of fireproofing theories could hope for.

There was a high wind blowing, some say almost a gale, or forty miles an hour. The portion shaded darkly on the map shows the section that was fire-swept, and the black line outside of that district shows the police and militia patrol limits, within which no one is allowed without a pass from the authorities.

I was able to note the intensity of the heat as indicated by its action on the metals and brick and stone, and, while the wind evidently played some peculiar pranks and made strange twistings, the terrible drafts created by the fire itself performed some wonderfully acrobatic feats, so to speak, in twisting lines vertically as well as horizontally. In places it would seem as if the blast had passed over three and four storied buildings to attack the six and seven storied ones most fiercely, while leaving the former to burn more slowly and sometimes from the top down. Three or four buildings escaped in this manner from absolute destruction; one, the Safe Deposit Company building, a two-story, well-built affair, went scot free, the brickwork and the iron shutters showing really but very little of the effects of the terrific heat that must have been all about it. Some actions of that fire baffle scientific explanation. In the very case of this Deposit Company building, I can understand how the fire could have swept over it so quickly, and there being nothing about its exterior that would readily ignite, that it should escape; but some distance away stands the old United States Stores building, across the street from the new Customhouse. On every side of this building its neighbors have been completely gutted, while it stands to all appearances absolutely intact. The glass in the windows is not broken and the window frames are but blistered, while the shutters inside the closed windows are charred and scorched. Could the heat simply have been intense enough to scorch this woodwork inside, through the glass, but, unaccompanied by flames, and being influenced by counter currents of air, it left the exterior unmarred? The building suffered some in the upper story, by reason of the breaking of the skylights and fire getting in that way. Then, here and there in the streets stand a wooden telephone or telegraph pole comparatively untouched and near by it an iron one twisted into all sorts of shapes.



MAP OF THE BURNED DISTRICT, BALTIMORE FIRE.

The combustion in the buildings was complete and most searching. Usually after a fire there will be charred bits of floor joists still sticking to the walls and masses of closely packed goods or papers on the ground, their very density preventing their combustion. But not so here. In most of the buildings burnt, particularly along the lines of the most intense fire shown in the diagram, there is not a vestige of anything but brick and iron left. One would think that the draft had drawn whatever little residue there might have been up and scattered it about in cinders and dust. Charred papers were found miles off, and whole sheets of tin were carried blocks away. Indeed, the suction or draft created was so great that many skylights and iron roofs appeared to have been at first lifted before collapsing. Some of the skylight glass appears to have been broken outward, too, and before fire could have had effect upon it from within. In some buildings the glass from the windows is mainly within them, and in others it is on the outside and well away from them, again showing that the suction of air along those streets, toward the vortex of the

fire, must have been something tremendous. Then, in some buildings, there is very little glass to be found; it seems to have disappeared; while about others I found stalactite formations of fused glass, which indicated the terrific heat there must have been generated.

The fiercest of the fire seemed to be centered where most of the important commercial houses were located. The fire fed on the factories and manufacturing plants below that point, and there, gaining tremendous headway and intensity, swept this commercial

GENERAL VIEW OF BURNT DISTRICT.

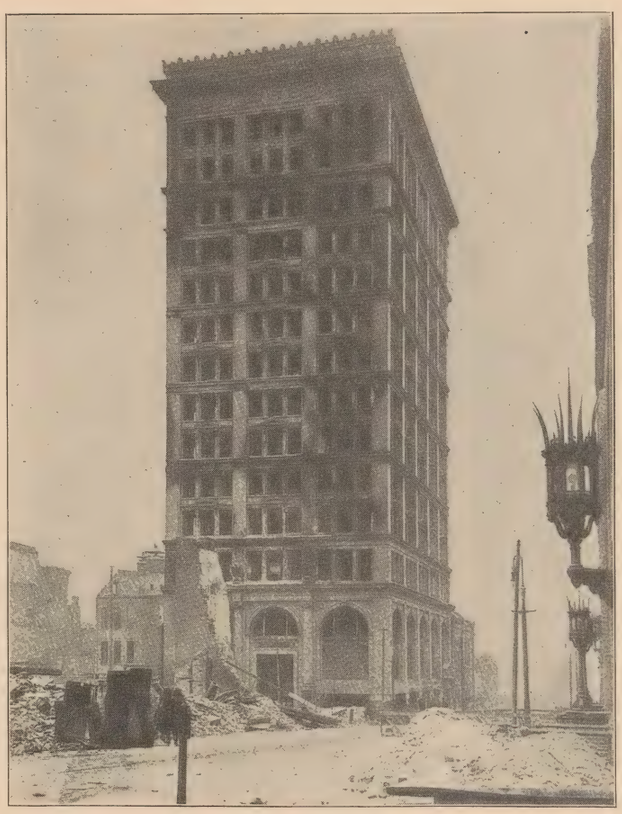
district virtually out of existence. "Slow-burning," "mill-constructed," and all kinds of buildings, good and bad, went by the board. The fire seemingly tackled them from the top first, in a quick, blastlike stroke, and then what might be called a secondary fire worked horizontally along and burned from the ground up to the point apparently first attacked by the fiercer flames.

The Continental Trust building, a fifteen-story structure, one of Baltimore's latest and best buildings, was attacked a little more than half way up of its height. You can easily follow the work of the fire in these tall buildings. The most intense blast struck it about the tenth floor. I found typewriters and other metallic materials in that story absolutely fused into a molten mass, which means at least twenty-eight hundred degrees. From that point up the flames were evidently less intense. Similar blasts to the first apparently struck this building subsequently and on the other side from that first attack, but these were undoubtedly of slightly less intensity; then the fire ate away from the second story upward more slowly and then downward. Of course, window frames and glass and the doors and the finish, even the floor strips in the concrete, and all the contents of this and the other fireproof buildings were destroyed. Some of the newspapers in their excitement stated that these buildings burnt as quickly and as completely as the wooden ones, and people, the unthinking ones, generally decry against the "so-called fireproof construction," as they call it, because they have discovered by this fire that they were wrong in their ideas that a fireproof building guaranteed immunity to even highly inflammable materials used in its decoration or stored within it. To say that the structures actually burned is, of course, foolish and manifestly incorrect, even to the most ignorant, because they are still standing and many of them in an easily repairable condition. Take the Continental Trust building, for instance. All the structural steel was encased in tile and not a bit of it is warped or out of level. The exposed metal portions are twisted into all kinds of fantastic shape, but the structure itself, the frame, is intact. The structural conditions of all these skyscraping buildings that were built at all within the general scheme of our theories of fireproofing stood the awful test remarkably well. The Equitable building makes a worse showing than any of the others. The soffits of its beams were exposed, the tile arches were segmental, the haunches were not concreted, evidently to save money, and on top of the beams was a heavy two-inch plank floor covered with a finished dressed flooring. But a portion of the webs of the beams being protected the heat has twisted and curved these beams all out of shape and necessarily distorted the columns so that the building will undoubtedly have to be entirely rebuilt. The structures of the Calvert building, the Herald, the Union Trust, the Maryland Trust, are in fair shape to be repaired as far as the structures go, for the steelwork was fully protected by the tile fireproofing.

These skyscrapers were built to contend with ordinary conditions. For instance, if the fire had originated in any of them it could not have gotten beyond control, and no one ever anticipated that they would be subject to any such test from without. Even if such a possibility had been thought of I venture to state that no one in Baltimore would have been willing to pay the increased cost that would have been entailed had these buildings been erected to withstand any such terrific heat and flame. And there are few places in the country where skyscrapers could be subjected to any such test. Those in New York are surrounded by a better class of building than generally obtained in Baltimore. So are those in Chicago. Such another conflagration is possible in a city like Boston, or San Francisco, or New Orleans, where you find great office buildings rising from among shanties and the most inflammable of structures, and vast areas of these all about.

In repairing these buildings in Baltimore, and in building new ones of their class in this burnt district, no greater precautions need be taken, as far as structure is concerned, than we find in the best of the old ones, say the Continental Trust, for instance, because a better general class of buildings than the old wooden ones will be insisted upon by the authorities, presumably, and in that case no such conflagration could again be possible in that district.

The general condition of the tile is good. Some are, of course, cracked, but in the floors there is no indication of the disintegration of the materials. In some places the bottom web of the floor arches has been knocked off. It is hard to say what caused this expansion. Water, perhaps, but one case that worried me a good deal was the absence of bottom webs on the floor arches in



CONTINENTAL TRUST BUILDING.

the vestibules of the Continental building. I was considerably relieved when told by one of the officers of the building that the marble men, in erecting their work, had knocked off all these webs for the purpose of facilitating the fastening of the marble! The superintendent who allowed anything of that kind to happen deserves at least castigation, but I was pleased, nevertheless, to find that this was no fire effect.

The granite and stone in all the buildings, skyscrapers as well as the others, is utterly destroyed. Possibly it may be recut in places, but the shaling and splintering generally puts it beyond redemption. The brickwork stood remarkably well and is simply another proof of our old theory that any material to successfully withstand fire must have gone through as severe heat in its manufacture as it will ever be exposed to afterward.

The decorative terra cotta here and there has been broken off, but on the whole it came out of the fray with flying colors.

MARYLAND TRUST BUILDING.

CONTINENTAL BUILDING.

The less glazing there is to terra cotta, however, the better. The terra cotta people should make their facework heavier and thicken up their internal angles, so as to overcome the natural weakness of the material at its angular connections with the face, and they should encourage the use of porous nonglazed surfaces.

Some people say that this fire proves that an *absolutely* fireproof building is virtually an impossibility, or one that under such stress would afford protection to its contents. It is only the unthinking who would make any such statement. The people who built the structures we have under discussion, the Baltimore skyscrapers, used fireproof methods only about their structural parts. In the finish and all else in these buildings there was absolutely no difference between them and the firetraps that stood all about them, and which have now disappeared from off the face of the earth. In so far as that fireproofing went it has been most eminently successful, and this terrible fire demonstrates its value more forcefully and potently than anything that has happened in the past twenty years.

Think of the test the steelwork was subjected to! Imagine dropping a lot of closely bound and connected metal, one very susceptible to variations in temperature, into a furnace where different parts of that metal would be subject at the same time to heats of 98°, 3,000° and 400°, and remember that that metal was encased in sometimes not over two inches of tile, and that its parts were not warped, disjointed or otherwise damaged by that terrific heat test. At some one time those tall buildings underwent about those variations of temperature. Realizing this, and having those buildings standing before us is splendid proof of their stability.

The great fire of Chicago, in 1871, had for effect that the country over frame buildings were barred within certain limits. This great fire of Baltimore is another step in the popular education and will result in people doing more thorough fireproofing in their structures, and using less damageable materials in their exterior and interior decorations. But this education is slow — awfully, pitifully slow — and enormously costly. It will take another such terrible experience to thoroughly impress the people with the fact that we so-called cranks on construction *are* right, and not making unreasonable demands in the line of improved methods of building. We realize and appreciate the possibility of such things happening, but people call us "croakers" until the things we foretold would happen do happen. Then they come to us and tell us how clever we are and ask our advice as to how *they* should build and then they go off and erect the flimsiest of things the too "complacent" laws will allow; because, forsooth, our way costs more money than they care to expend.

The perfectly fireproof building — fireproof in the sense that the average man interprets the term (in that no damage can be done to the building by fire and that all he may put within that building is absolutely safe from external attack) — *is* possible. I could build a structure, a skyscraper, upon which even an inferno like that at Baltimore would not inflict more than a few hundred dollars' worth of actual damage. But who in these times of careful calculation of dividends and returns upon investments would pay for such a building? I would build its exterior all of brick, or hollow tile, and with molded brick trimmings, and some little terra cotta ornamentation, more carefully made and burned than the usual commercial terra cotta; not a particle of marble, stone or granite would be outside of that building. I would make the frame of steel, just as we do to-day and no heavier, and I would carefully encase all that steel in tile, a trifle heavier and thicker than is the average on the market to-day; the floors would be of hollow tile arches, covered with cement, or tile, or marble — no wood; all the window and skylight frames would be of metal covered with heavy asbestic covering; all the windows and skylights I would doubly glaze with wired glass; all the casings and finish would be of cement and the doors of metal, and each story cut off from the other absolutely, no open elevator or stair-wells. Such a building, with the ordinary precautions, suggested by the average intelligence, closed windows and some water and other fire-fighting appliances within, would have withstood that fire in Baltimore unscathed and would have protected all that might have been within it from damage in spite of the nearly three thousand degrees of heat developed at some points during that fire!

But the exigencies of the time seem not to permit so perfect a structure. Even fireproofing tile has been reduced in thickness to its minimum ability to withstand ordinary fire; the trade demands it, people will not pay for more tonnage. Everything that goes into a building has to be pared down and shaved, particularly in the structure, so that there may be profit in renting

B. & O. BUILDING.

EQUITABLE BUILDING.

CALVERT BUILDING.

the building. If there is anything upon which money is spent at all lavishly it must be fine carvings on the outside and rare marbles and polished woods inside, things that catch the eye and give an apparent value to property. Natural enough, but lamentable just the same, and in Baltimore's case, at least, exceedingly expensive ultimately.

Architects are too prone to take certain standards of make of any material and use it everywhere, regardless of varying conditions. Now, as I said before, in the upbuilding of this district of Baltimore, or in building in sections in other cities that are pretty well filled up with good buildings, mostly fireproof structures, nothing more is needed than was used in Baltimore's skyscrapers we now have under consideration. But in crowded districts of comparatively flimsy structures, in just such a place as

THE NEW COURTHOUSE.
(Low building — wood joists, steel beams, and cast-iron columns — "a horrible example.")

were those very buildings in Baltimore, and in other old cities where like conditions exist; or in New Orleans, or San Francisco, or Boston, or in some parts of New York, or in other extra hazardous positions, why not take *extraordinary* precautions and use a heavier and thicker tile in floors and in encasing the steel; wired glass on the exposed fronts, and at least metal frames at such exposed windows. Why should not every precaution be taken that experience teaches us is necessary or that even tends to minimize the damage that could be done by just such another conflagration?

A considerable portion of the Customhouse now under construction will have to be torn down. In one place there is a granite cornice temporarily covered over with planks; the planking is not even scorched, while the granite underneath it is shaled off, cracked and badly scaled. Most of the damage was by heat unaccompanied by flames. Some of the ironwork inside, not yet protected with fireproofing, will also have to be taken down. The handsome marble courthouse, recently completed, was somewhat damaged externally. It was just outside of the zone of fire, but received a hot enough blast to damage its stonework to the tune of $75,000 or so.

In Baltimore, as everywhere else, there was and is some lamentable negligence in the way of superintendence, which simply goes to prove, as I have always contended, the folly of using any material whose safety in construction depends absolutely and solely upon perfect superintendence. For instance, in the Continental building the brickwork is, of course, carried from story to story. I noted great patches on the side-walls, some thirty or more feet in length by the full height of a story, where the entire facing course of brick had been detached and had fallen off, showing that in all that extent of wall there was not a particle of bond, either of metal or of brick, between that course and the backing. Such work as that and the allowing of marble workers, and steamfitters, and other craftsmen to ruthlessly break through flooring and cut everything to pieces in order to install their work with greater ease is certainly shameful and shows culpable and criminal negligence on the part of the superintendent who allows it.

In the fireproof buildings, most of the partitions were in most excellent shape, but I noticed in one that whole sections of partitions were on the floor, in connected condition, and not in the shape they would have been had they fallen there. It seemed a case of their being thrown down by some terrific force. The fire could have had no such effect unless the draft was even greater than the maximum of my calculation — the rate of 180 miles an hour was undoubtedly reached — and it certainly was not the work of the firemen. Insistent investigation showed me that they had tried to cut off the fire near that point with dynamite and it was these series of explosions so near that had thrown down section after section of those partitions in such peculiar shape and manner.

A considerable part of the front wall of the Union Trust building will have to be taken down. The steel frame in that outer wall was not carefully enough protected, so that the heat has warped it, and as a result that front wall is distorted into all sorts of shapes. It is in a dangerous condition. The interior framing is, I believe, in perfect condition.

It is to be regretted that there were no important or tall concrete construction in that zone of fire. Had there been we certainly would have had a good basis of the comparative value of that mode of construction. There was but one concrete building that I could find. There may have been others that were destroyed, but the one I examined was about 30 by 70 feet, four stories high, built on the Hennebique system, and it seemed fairly intact except in one or two of its concrete beams. The condition of the iron front shows that there was a quick attack of flame and it is evident that there was comparatively little combustible material within the building, because even the gas pipes are in fairly good shape. That the floors stood up while the wooden floors in the adjacent buildings were destroyed proves that the system is certainly better than wood — if the building can be gotten completed without collapsing — but that this was a test of what it would do in a tall construction or in a more exposed place is stretching the point to its utmost elasticity. That the heat and flame in that one section, as in some other low points, were comparatively quickly over and not of the most intense, is shown by the condition of the metal in this building and by the fact that directly across the street, in one of the fireproof skyscrapers, the Maryland Trust building for the same height up, four or five stories, the decorative plastering on the ceilings is not even

UNION TRUST BUILDING.
(Note condition of stonework.)

charred, and some of the light fixtures are hanging intact. The fire seems to have swept by at frightful velocity, quickly devouring all woodwork and anything combustible, but leaving even the concrete and plastering in pretty good shape. The plastering and everything else in the Maryland building, above the fifth floor, show that the heat was vastly more intense above the line of that

concrete building. I should imagine that the heat at that one point was not over six hundred degrees; at the seventh and eighth floors in some of these buildings, the skyscrapers, it must have reached nearly three thousand degrees, because I found in one place a safe that was not only warped all out of shape, but one of its angles, that nearest the window, was fused, molten down, and had trickled much as candle grease does over a candlestick. Again at the twelfth and topmost stories I noted that some brass had but begun to fuse alongside of some cast iron that was badly warped, but had not nearly reached the fusing point. The heat there was very certainly not over two thousand degrees, while in other places, on the top of three and four storied buildings, I found lead that showed no signs of fusing, all of which would indicate that the heat was most intense at the point where the first blast of flame struck those tall buildings. The resulting variation of temperature in the height of these skyscrapers was enough, one would think, to distort the steel whatever it might be encased in or protected with.

Much is to be learned from that fire in the way of improving methods to fight fire, bettering water systems and all that sort of thing, but as far as the actual science of building is concerned, it neither revealed, demonstrated nor proved anything engineers and fireproof specialists did not know before and have so persistently advocated heretofore.

A PROPER BUILDING CODE.*

BY FREDERICK BAUMANN.

THE task of establishing building regulations for a large city is and will ever be one of the most difficult problems in legislation. In common with all kinds of legislation it curtails individual freedom for the benefit of a community. Since legislation, to be wise, stops, or ought to stop, at proper limits, it will or ought never to encroach upon individual rights. These are the primeval basis of all freedom, and should by all means ever be kept sacred. Wherever there appears to be a just doubt, decision should always be in favor of freedom. It is an old rule in common law that it is better to let ten suspected citizens go free, than to innocently punish one. This wise rule is, in its broadest sense, especially applicable as to building laws, and it should never be left out of sight. It should always be kept in mind that the framing of such laws ever demands foresight and caution in every sense, as a sure basis of strict justice in them.

As an example as to what a legislator should beware of, the late amendments to our building laws, made in consequence of the horrible catastrophe in the Iroquois Theater, may fairly be adduced. The question was here as to establishing proper emergency exits. A broad consideration of the subject would undoubtedly have at once led to the opinion that where such exits could be had at each side of gallery, as well as of parterre, there they would be the surest and most convenient. Such can be had, and only had, with a theater which is located between adjoining side buildings. Yet this greatest convenience to an audience remains expressly forbidden by the new as it was by the old ordinance, and it is still deemed to be a great boon for women and children to have the opportunity for climbing out on a sort of slippery iron stepladder. Then the amendments reordain platforms to stairs, irrespective of the fact that the same, properly considered, are a matter of mere show, which does not concern a legislator, and if this were desired, that the use of platforms should be forbidden, instead of ordered, because they are rather a hinderment to people desirous of the most rapid descent. Errors are further committed in what is specified in regard to stairs. Duly acknowledged it is that descending crowds ought to find firm handrails to all stairways, but the fact appears to be neglected that the width of stairs should be in due conformity with what is required for human beings. Stairways, for two persons descending side by side, should accordingly be about four feet wide; for single files, two feet wide from centers of rails. Broad stairs should thus be subdivided accordingly. These rules are not a novelty; they simply involve what may be understood as common sense. Descending crowds must ever be given a good chance for safety against overanxious followers, and for this reason it is required the stairs should be of proper narrowness and with firm handrails. These sound demands are not altogether complied with in the amended ordinances, which do not demand subdivisions in regard to broad stairs, while they do demand that no stairs shall be less than three feet wide. It is also provided that there shall be no more than fifteen rows of seats in parquet and five on any gallery without a cross aisle, and further, that no rise of any seat above another shall exceed eighteen inches. It is indeed difficult to see any use or propriety in such provisions. They are, as it would seem, dictated merely by a wanton lust for legislation which now and then may overcome the best of men.

I have adduced the above merely to show how difficult it is to produce sound legislation. The mind of a lawgiver must indeed be broad and clear, and for proficient work he must have leisure and free disposition, neither of which qualities could have entered into the drawing of the ordinances in question.

Building laws are police regulations, in which the practicing insurance companies are deeply interested. It is at once evident that the phenomenal growth of Chicago made this interest very prominent, so that, soon after the great fire, when the fire limits, so-called, had been extended to the very limits of the old city, the Board of Underwriters undertook the preparation of a building code. It was the late Gen. A. C. Ducat who, as chairman of the board, appointed a committee for this purpose. The late Charles W. Drew was made its chairman. I served as expert member, and later on our Mr. P. B. Wight gave assistance in the work. A sort of ordinance was framed and submitted to the council for adoption. But, as might have been expected, it was repudiated and shelved. It was temporary in scope, rather than permanent, but it contained what seemed to me a rather important section to this effect: that frame buildings were to be wiped out of existence by ordering exterior parts of them to be repaired exclusively with fireproof material. It was thought that within the next coming twenty years all streets would appear as being rid of frame buildings. This would have led to the effect of decreasing insurance rates, and in some degree of keeping down the expenses as to apparatus and men required for extinguishing fires. Indeed, it would appear as though many millions might thus have been saved by the community in the course of time to this present day. But "politics" were, and have ever been, against this boon. It has been held that such beneficial provision was against the interest of "the poor man."

About a year subsequent to the rejection of the Underwriters' building code, Alderman Bailey made up from it, intermixed with notions of his own and some on the part of his friends, the first positive building code for our city, though later on Alderman John M. Van Osdel, as chairman of the Committee on Buildings, materially improved the same. This soon proved to be inadequate for our so rapidly growing city and was followed by a number of committees, appointed from time to time by the authorities, for its further improvement.

It is but fair to say that unquestionably the members were devoted to their task and brought to light quite a number of important improvements. Yet the code as it is, with all its many very proper provisions, is really far from being fit for its purpose. It shows itself in many regards as a haphazard makeshift. It fails to cover the ground. It shows itself bare of every effort toward making it intelligible, as it ought to be, to the plain citizen, so much so, as late investigation has shown, even city officers were in ignorance of its provisions. It is not clear in its language, and this not alone in a legal sense. The fact is, no lawyer can at once conceive and frame technical matters which are remote from his information, and the committee member, with all his technical knowledge, generally fails in his attempts at legal language. Thus it will happen that he fails to be clear, and the revising attorney, in despair as to an understanding, allows inadequate language to pass, as he can not afford the time to correct it. Thus the effort of preparing good building laws has ever been beset with difficulties. But it should be kept in mind that each committee member had his own private business to attend to, and that the work was dragged on in open sessions. It is indeed astonishing that so many good points were ever brought up and adopted.

Accordingly it may justly be said that the time is more than ripe for the enactment of an entirely new building law, and I flatter myself that the building profession at large shares in this opinion. A mere revision of what there now is on hand would be to no purpose. The whole theme requires to be freely reconsidered as to contents, all parts duly headed and brought into systematic order. The task is so wide and complicated that at once it will appear to be utterly impracticable for any regular committee to take it in hand. The problem, which it is, rather calls for work on the part of a committee of one, who can and will devote all his energy to the work. Having gathered every outside information, he should intimately consider all points and newly write it up in due form of a code in systematic order, and under the counsel of a competent lawyer. Where self-evidence is not plainly apparent he should state his proper reasons. The code thus completed to be submitted to all public officers and all parties generally or specially interested in building matters, with a request for opinions and suggestions to be noted on the margins. The thereupon reprinted code to go finally to the proper enacting committee appointed for the purpose.

But with all this preliminary caution it should not be taken for granted that the resulting code will be fully complete and perfect. The subject matter is so very complicated and human foresight is wanting. Besides, building construction is ever progressive. New complications must be expected to arise from time to time, calling for speedy adjustment. Matters of building should never be subjected to delays on account of deficiency or want in regard to regulations, nor should they ever be left to the out-and-out decision on the part of a building commissioner, whose office it is to carry out the law, and not to contract or expand it. To a board of commissioners such power may be granted, but the time for such boards has passed. They can not handle matters with due business rapidity. There should rather be an accompanying committee of three, with an architect as one of them, having power to regulate, revise and act, holding regular meetings once in every month. The commissioner to be subject to this committee, render accounts, and propose whenever required and present the proper amendments to the law to the

* Paper read before the Architects' Business Association of Chicago, March 7, 1904.

city council for passage. In order to permanently stop the heretofore constant interference of aldermen with the building regulations, it may be provided that both alderman and commissioner be subject to a heavy fine in any unauthorized interference. Proper provisions should be made in the law, in regard to subofficers and inspectors, which should be so regulated that the number of the latter be in constant conformity with the number of city inhabitants. The income of the department may readily be made independent and sufficient and kept in the treasury as a special fund. Due effort should be made to abolish all sorts of mere red tape. Building permits, in particular, should ever be obtainable without any mere waste of time.

TOWER GROUP, UNIVERSITY OF CHICAGO.

A NOTABLE addition to the buildings of the University of Chicago has recently been completed at the corner of Lexington avenue and Fifty-seventh street. These new buildings are known as the Tower Group, and embrace the Tower, Hutchinson Hall, Reynolds Clubhouse and Mandel Hall. The style of these buildings follows the perpendicular period of English Gothic architecture, on the order of the collegiate buildings of Oxford and Cambridge. The main entrance is at the tower. From the vestibule, which has an oak-beamed ceiling, ascend two flights of stone steps 30 feet broad leading to the vaulted hall from which the several buildings of the group are entered. South from this hall, through the cloister, is a vista 240 feet in length to the stage of the Assembly Hall.

At the west is the entrance to Hutchinson Hall, the men's Commons or dining-hall, where there is a nook with two large seats and a fireplace. This dining-hall is 40 feet wide and 115 feet in length, with walls to the height of 16 feet in wainscoted oak with a cornice of appropriate leaf ornament, and above this are the traceried windows. At least 50 feet from the floor are trusses of open timber-work spanning the space from wall to wall. Pendant from the hammer beams hang lanterns of oak decorated in red, blue and gold. The kitchen is entered from the dining-hall through two vestibules.

To the east of the vaulted hall is the Reynolds Clubhouse, the main stair hall of which suggests the Elizabethan period of architecture. To the left of the stair hall is the reading-room, 36 feet wide by 68 feet long. To the right is the billiard-room. On the second story are the reception-room, clubroom, etc. There are clubrooms also on the third story. On the third story the main feature is the assembly hall, which has trusses of open timberwork of sycamore and a small stage at the north end. The principal rooms on the first and second stories have paneled wainscoting and beamed ceilings of oak and stone mantels elaborately carved. Bowling alleys, barber-shop, etc., are in the basement. Across the cloister from the Clubhouse is a café occupying an area of 2,680 square feet. Bake-ovens, storerooms, refrigerators and laundry, etc., are in the basement of the kitchen building.

South from the vaulted hall, through the cloister, is the entrance to the Leon Mandel Assembly Hall, which will be used for convocations, mass meetings, lectures, etc. The blower system of heating and ventilating has been used. The Gothic style is noted in all lighting fixtures, hardware, etc.

One of the beauties of Bedford stone as a building material lies in its uniformity of color, and therein is the great value of the stone quarried from the noted old Hoosier quarry of the Bedford Quarries Company at Bedford, Indiana. This noted quarry has supplied the stone for this group of buildings, and the result is apparent as compared to some of the other buildings of the university, showing a mottled face where stone of other quarries has been used. Bedford stone lends itself readily to rich carving and decoration, as shown in the illustrations. The window frames and forms are of stone, taking the place of iron or wood, so generally used, giving a tone of strength and character to the façade.

Properly, the decoration of the Tower Group has followed as far as possible the architecture; the warmth and color of the building materials give the key-note to the decorative scheme. The entrance walls to the Tower and Commons, the Cloister and Mandel Hall are in a warm stone color, while the woodwork throughout the group is in weathered English oak. In the Commons the walls above the oak paneling are stained in the spirit of the Christ Church College, Oxford. The treatment of the cornice above the paneling is with grotesque heads in old ivory, with red tongues and a band of golden stars on the blue ground. The end cornices are ornamented with the arms of the English colleges, and those of the principal American colleges appear on the side cornices. These are in college colors. The initials "H. H." — Hutchinson Hall — are in a shield between each of the American arms. The treatment of the ceiling is the same as the paneling, giving the appearance of being colored by age. The pendants of the ceiling are picked out in dull red, blue and gold. In the library and billiard-room the friezes are designed appropriate to the period. In the main rooms on the second floor the walls and ceilings are treated in weathered plaster. The smaller rooms are in rather strong color. The aim has been that the color and furniture should introduce nothing but what was demanded as a complement to the architecture.

All the multitudinous details incident to such a group of buildings of a high order of construction and ornamentation have had the skilful and intelligent attention of the contractors, The Wells Brothers Company. This group is another addition to the long list of important buildings completed by this company to the full satisfaction of architects and clients.

All of the electric wiring in this group of buildings was installed by the well-known firm of contracting electrical engineers, Kohler Brothers, Chicago. The stage switchboard in the Assembly Hall is of white Italian marble, containing the necessary apparatus for controlling the different lighting effects, which are most beautiful. From this board also is controlled the curtain for stereopticon exhibitions, and the window shades, which are automatically operated by electricity in a very ingenious manner, and which work simultaneously and in harmony with each other to produce the necessary effects. All of the mechanical and electrical devices for operating this curtain and the shades were designed by Kohler Brothers.

HOT WATER AND TANK HEATERS.*

THIS small laundry heater fills a long-felt want in many residences. It heats large quantities of water quickly, and its construction admits of its use for cooking at the same time. One of the most vexatious problems of housekeeping is solved if plenty of hot water is at hand, and when one of these small, powerful heaters is installed no more worry need result from the absence of this household necessity. It is also extensively used in hotels, shops, barber-shops, laundries, etc.

The base is square, fitted with draft door and adjustable legs, and in its top the grate is placed. This grate is of the substantial triplex type, the same as the Model boilers are equipped with, and by the operation of one shaker the whole grate is set in motion. The body of the heater is a hollow cylinder, and rests upon the grate. It is provided with supply and return tappings, and the water circulates around it with great ease and rapidity.

The top, which is flat, rests upon the top of the body and has within it a system of baffle plates which guide the gases and products of combustion under its entire surface. The size of the fire chamber, formed by the grate, sides of body and top, is carefully calculated to provide for the most perfect combustion and expansion of the resulting red-hot gases so that it seems remarkable that so much heat can be obtained and utilized from the small amount of fuel which is necessary to operate this heater satisfactorily.

The flat top is intended primarily for heating flat-irons, but it can also be used for cooking; and to provide for pots and kettles, we have provided a four-part graduated cover placed in the center of the top.

The capacities of the sizes of this heater for radiation range from 75 to 150 square feet, and its water-heating capacity ranges from 100 to 200 gallons per hour.

The particular purposes for which "Little Giant" and "Improved Giant" heaters are intended are for supplying hot water for laundries, dwellings, kitchens, hotels, flats, distilleries, baths, barber-shops, etc.

The details of their construction are more minutely described under the separate heading of "Little Giant" and "Improved Giant," and it is our purpose to thoroughly recommend them as tank heaters, knowing their great capacity for work and their staying qualities, even under the most adverse conditions. They burn all kinds of fuel with ease, and their construction enables the water to absorb an enormous percentage of the heat evolved from the fire. The capacities of the different sizes of the Improved Giant range from 215 to 520 gallons per hour, and of the Little Giant, 80 to 550 gallons per hour.

The fire-pots range from 11 to 20 inches in depth, which allows for ample fuel to last over night.

The Little Giant Heater has a flat top with a circular lid which may be found convenient for some purpose.

These heaters are made of the same high-grade material and with special care as to their requirements.

Steel storage tanks of many sizes and capacities are also manufactured by this company. The selection of a storage tank is most important, as the capacities given above are based upon the understanding that sufficient storage tank capacity shall be used.

A NEW typewriting machine has been placed on the market that seems not only by its simplicity and accuracy of mechanical action to be an improvement on other machines for general office-work, but seems especially adapted to the personal use of the architect in special work which he desires to write with his own hands. It is called the "Chicago." It avoids vibration in its action, and the great advantage of having the mechanism all enclosed and many other attractive features, such as superiority in tabular work; adaptability in changing from ordinary type to extra large roman; adjustable type wheels, by which French, German and other languages can be written, to say nothing about its price, which is an appreciable discount upon the price of other first-class machines.

THE TWENTIETH CENTURY WONDER is really so meritorious that architects are advised to look up the advertisement in this number and write for sample boards and information.

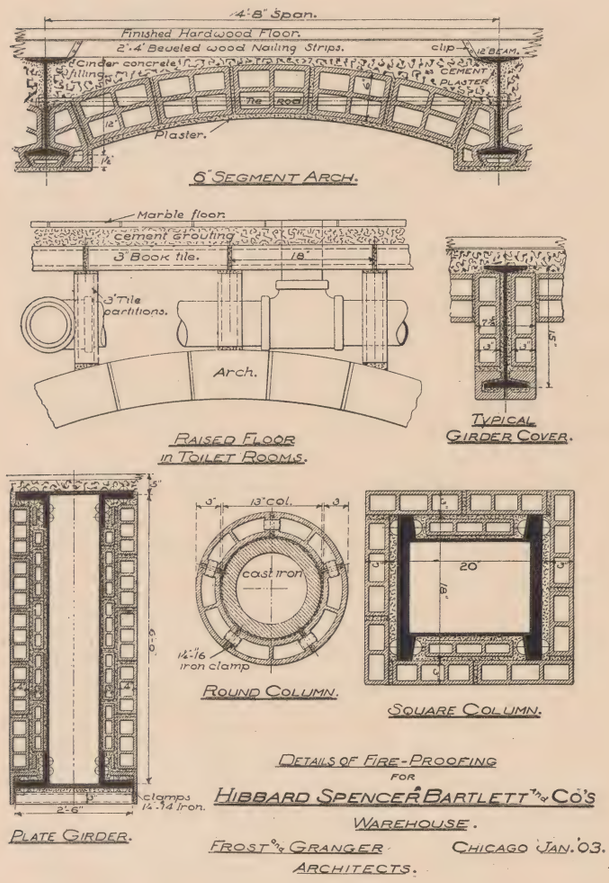
*From *The Boiler Magazine*, Kellogg-Mackay-Cameron Company, Chicago.

A COMMERCIAL BUILDING.

THE needs and requisites of a thoroughly successful commercial building are represented in its capacity for storage, its facilities for the handling of the intake as well as the outgoing merchandise, its fire protection devices and its isolation from other buildings, so that all sides may be utilized to advantage for shipping as well as guarding against external fire. All these characteristics seem to exist in a marked degree in and about the Hibbard, Spencer, Bartlett Company's building, erected from design and plans by Messrs. Frost & Granger, architects, on the land bounded by State street, South Water street, Wabash avenue and the Chicago river, the latter allowing of fine docking facilities. The building is ten stories high, of heavy steel construction. The façade shows strength and character; a facing of Bedford stone reaching to the third floor, with a dark red brick utilized for the succeeding floors, lends a decidedly pleasing contrast to the exterior.

The fireproofing of this building is of the hollow-clay, semi-porous type, cellular in construction and fired or burned to 2,000° F. before ready for use.

Without doubt the necessity of proved fireproofing is of the greatest interest to the people, as well as the architect, engineer



and owner. The property to resist the fierce onslaught of fire caused by the vacuum of flame and heat without disintegrating, is one of the most valuable points of cellular or hollow-clay fireproofing tile, used in this building. The hollow chambers of the clay allow the heat to expand, as well as the material itself, when attacked at one point, thereby dissipating the danger of a retention of heat at a given point, as it would be the case where solid materials are used as a fireproofing. As a saying of an old scientist goes, "Nothing is fireproof unless it has been put through the fierce flame of purification."

Clay tile is the material used in blast furnaces, and the clay tile fireproofing used in this building is of the same character, installed by the Pioneer Fireproofing Company, of Chicago, from whom the following details have been secured.

The total floor area of the building is about four hundred thousand square feet. The fireproofing, including the floor and roof arches, as well as the complete protection of columns, lintels, facias and other iron and steel work, with this semi-porous hollow fire tile, covers nearly ten acres of space.

The steel girders in connection with the floor system throughout the entire building are covered with three-inch tile before the arches are put in position, thus insuring perfect protection to these important structural members. All the columns of the building are covered with three inches of hollow clay tile, shaped to curve of the column.

Every precaution has been taken by the architects to insure safety from fire. The detail plans furnished, which illustrate the system used, will lend aid to those interested enough to study and appreciate values of fireproofing.

To guard in a safer manner the merchandise contained in this building, it has been divided into three compartments by fire-walls being built from basement to roof. This wall is pierced on all the floors and the openings are provided with heavy iron doors, and are closed in a similar manner as used on ships for water-tight compartments.

The elevator shafts throughout the building are built of brick, and all openings protected by iron doors, as are also the entrances to the iron stairways leading from the different floors. By this system in the use of fire walls and heavy iron doors, it is absolutely possible to confine a fire, should any occur in a large stock of merchandise, to the floor or compartment in which it originates, without communication to the rooms on either side or the floor above or below. The doors used are of special pattern of the Variety Manufacturing Company, 79 West Lake street, Chicago. To protect the eleven shafts and the fourteen openings on each of the floors, guarding against the spread of fire, over one hundred and forty iron doors of the above type have been put in place. Another interesting feature relative to fire protection in this building is the use made of metal furniture in the accounting department, all desks and partitions consisting of specially designed solid metal having been utilized.

The foundations of this building represent the latest and most advanced ideas of caisson construction and protection against any dampness or encroachment of the Chicago river. A wall ten feet thick, of solid cement concrete, protects the building from the river; piles driven to a depth of fifty-five feet act as the base of this wall. The caisson piers for the steel building columns are sunk to a depth of ninety feet to hardpan. To show the extent to which cement was used in the foundations, the statement is made that twenty thousand barrels of cement were put in place and was supplied by Meacham & Wright Company, local representatives of the Lehigh Portland Cement Company.

This building represents a start in the improvement of our river front, and with the advance steps being made with new bridges of the latest and improved type, the river's clean-looking water and the gradual small changes in the appearance of the face of its docks and shore line, lends the idea that before long Chicago will be proud of her river, once so much despised.

MOSAICS.

JOHN GALEN HOWARD and D. Everett Waid, architects, have dissolved partnership. Mr. Howard is professor of architecture in the University of California and will make Berkeley, California, his home. Mr. Waid will continue the New York practice and retain the offices at 156 Fifth avenue.

WILLIS POLK, after an association of three years with D. H. Burnham & Co., of Chicago, has decided to remain in San Francisco and has formed a copartnership with G. A. Wright of that city.

ONE of the oldest and most widely known representatives of stained glass art in the West is John A. McCully. He is now making his headquarters in Chicago in the interest of the Church Glass and Decorating Company, of New York, who are the sole agents in this country of the stained glass windows of John Hardman & Co., of England. The stained glass art is so thoroughly understood by Mr. McCully and the Hardman quality so well understood that it is a distinct advance in stained-glass art to have this headquarters established in Chicago.

OUR ILLUSTRATIONS.

Library, Leland Stanford University, Palo Alto, California.

Carnegie Library, Spencer, Iowa; Patton & Miller, architects, Chicago. Cost, $10,000.

Carnegie Library, Taylorville, Illinois; Patton & Miller, architects, Chicago. Cost, $15,000.

Kendall Young Library, Webster City, Iowa; Patton & Miller, architects, Chicago. Cost, $40,000.

Interior View, Entrance, Warehouse for Hibbard, Spencer, Bartlett & Co., Chicago; Frost & Granger, architects.

The Thomas Hendrick Library, Hanover College, Hanover, Indiana; Patton & Miller, architects, Chicago. Cost, $25,000.

Views in Residence of J. J. Tootle, St. Joseph, Missouri; Eckel & Mann, architects. Reception Hall and Dining-room are shown.

Interior Views Chicago University, Chicago; Shepley, Rutan & Coolidge, architects. Hutchinson Hall, The Café, Reynolds Clubhouse and Main Stairway of same are shown.

Photogravure Plate: View from South, Tower Group, Chicago University. Shepley, Rutan & Coolidge, architects.

PHOTOGRAVURE PLATES.

Issued only with the Photogravure Edition.

Warehouse for Hibbard, Spencer, Bartlett & Co., Chicago; Frost & Granger, architects. Street View and River View are shown.

Views of the Tower Group of Buildings for Chicago University; Shepley, Rutan & Coolidge, architects. The following plates are shown: East view, Reynolds Clubhouse and Mandel Hall; view from Northwest of Hutchinson Hall and Founders' Tower; Founders' Tower from northeast; Landing, Main Stairway, Reynolds Clubhouse; Interior View, Mandel Hall.

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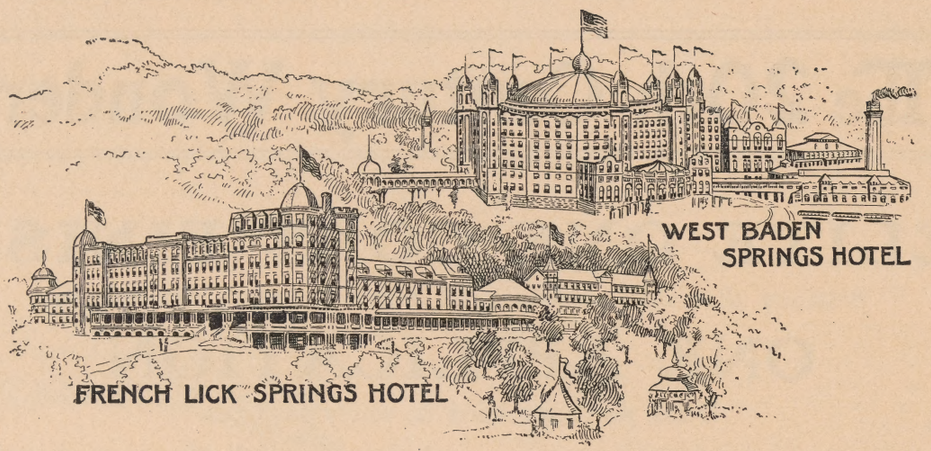

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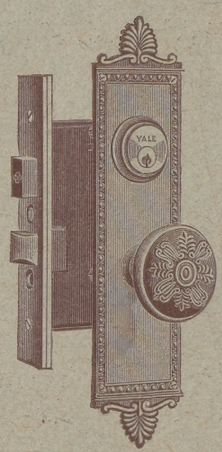

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